

What is claimed is:

1. A capsule endoscope guidance system including a member having an elongated flexible portion which can be guided to a desired position in a body cavity of a patient's body by manipulating a distal end portion of said member wherein the elongated flexible portion bends in accordance with an operation at a proximal end portion of said member, comprising:

a capsule endoscope holding device, provided at a distal end of said elongated flexible portion, for removably holding a capsule endoscope; and

a removal/attachment manipulation device provided on the proximal end portion, for manipulating removal and attachment of the capsule endoscope holding device.

2. The capsule endoscope guidance system according to claim 1, wherein said capsule endoscope holding device comprises forceps inserted from the proximal end of the elongated flexible portion so as to project from the distal end thereof in order to hold a capsule endoscope.

3. The capsule endoscope guidance system according to claim 2, wherein said member having said elongated flexible portion comprises an endoscope.

4. The capsule endoscope guidance system according to claim 1, wherein the capsule endoscope comprises, in a water-proof sealed capsule container:

an image pickup device;

a driving signal output device for outputting a driving signal for driving the image pickup device;

an illumination device for illuminating an object  
5 image is to be captured by said image pickup device;

a transmission device for wirelessly transmitting a video signal, captured and output by the image pickup device, outside said water-proof sealed capsule container; and

a power source for supplying electric power to said  
10 image pickup device, said driving signal output device, said illumination device, and said transmission device.

5. The capsule endoscope guidance system according to claim 4, further comprising:

a receiving device for receiving a video signal, said  
15 video signal being transmitted from the capsule endoscope by said transmission device; and

a monitor apparatus for visualizing the video signal received by the receiving device;

wherein said receiving device and said monitor  
20 apparatus are provided externally, outside the patient's body.

6. The capsule endoscope guidance system according to claim 4, wherein said capsule endoscope holding device is equipped with a power source supply device for supplying  
25 electric power to the capsule endoscope while holding the

capsule endoscope.

7. The capsule endoscope guidance system according to claim 4, wherein said capsule endoscope holding device is equipped with image pickup device driving signal output  
5 device for supplying an image pickup device driving signal to the capsule endoscope while holding the capsule endoscope.

8. The capsule endoscope guidance system according to claim 7, wherein the capsule endoscope holding device  
10 is equipped with a video signal transmission device for receiving transmission of a video signal output from the capsule endoscope while holding the capsule endoscope.

9. The capsule endoscope guidance system according to claim 6, wherein the capsule endoscope further includes  
15 a switching device for switching to an operation powered by an external power source supplied from the power source supply device while said capsule endoscope is held by the capsule endoscope holding device.

10. The capsule endoscope guidance system according to claim 7, wherein the capsule endoscope further includes  
20 a switching device for switching a driving mode of the included image pickup device driven by an image pickup device driving signal, input from the capsule endoscope holding device, while said capsule endoscope is held by the  
25 capsule endoscope holding device.

11. The capsule endoscope guidance system according to claim 6, wherein said capsule endoscope further comprises:

a detection device for detecting that the capsule  
5 endoscope is held by the capsule endoscope holding device;  
and

a switching device for switching to an operation powered by an external power source supplied from the power source supply device when the detection device detects that  
10 the capsule endoscope is held by the capsule endoscope holding device.

12. The capsule endoscope guidance system according to claim 7, wherein the capsule endoscope comprises:

a detection device for detecting that the capsule  
15 endoscope is held by the capsule endoscope holding device;  
and

a switching device for switching an image pickup device driving signal for driving the included image pickup device driven by an image pickup device driving signal input  
20 from the capsule endoscope holding device when the detection device detects that the capsule endoscope is held by the capsule endoscope holding device.

13. A capsule endoscope holder for removably engaging with an engaging portion formed in a capsule  
25 container of a capsule endoscope, comprising:

a member having an elongated flexible portion which can bend in accordance with an operation at a proximal end of said member, the distal end of said flexible portion being inserted into the proximal end of said capsule endoscope, which is insertable into a patient's body, so that said capsule endoscope projects from the distal end of said flexible portion; and

an engagement member provided at the distal end of said elongated flexible portion, for removably engaging with the engaging portion of the capsule endoscope.

14. A capsule endoscope holder for holding a capsule endoscope including an engagement hole having a narrow opening formed in a sealed capsule container, comprising:

a member having an elongated flexible portion which can bend in accordance with an operation at a proximal end of said member, the distal end of said flexible portion being inserted into said sealed capsule container, which is insertable into a patient's body, so that said sealed capsule container projects from the distal end of the flexible portion; and

an openable/closeable engagement member provided at the distal end of said elongated flexible portion,

wherein said openable/closeable engagement member is inserted into said engagement hole in a closed state, is opened outwards inside said engagement hole to be engaged

in the engagement hole so as not to be pulled out of the engagement hole; and

wherein said openable/closeable engagement member is closed in order to be pulled out of the engagement hole.

5        15. The capsule endoscope holder according to claim 14, wherein said member of said capsule endoscope holder is provided with a flexible pipe;

wherein said openable/closeable engagement member includes a movement manipulation member provided at the proximal end of said flexible pipe and a cable driven by the movement manipulation member, the movement manipulation member and the cable being slidably inserted into said flexible pipe; and

wherein said openable/closeable engagement member is 15 attached to the distal end of said flexible pipe, said openable/closable engagement member being closed and opened by relative movement between said cable and said flexible pipe.

16. The capsule endoscope holder according to claim 20 14, wherein said sealed capsule container, which is insertable into the patient's body, comprises an endoscope.

17. The capsule endoscope holder according to claim 15, wherein said openable/closable engagement member comprises:

25        four connecting members; and

a plate-like member driven by a cable so as to project from and be drawn back into said flexible pipe;

wherein said four connecting members constitute a quadric crank chain by a fixed shaft attached to the distal  
5 end of said flexible pipe and a driving shaft attached to said plate-like member, said fixed shaft and said driving shaft being relatively moveable to be away from each other and to approach each other; and

wherein said fixed shaft and said driving shaft move  
10 away from each other and approach each other in a direction orthogonal to a moving direction of said plate-like member via movement of said plate-like member in projecting and drawing directions with respect to said flexible pipe.

18. The capsule endoscope holder according to claim  
15 17, wherein when said openable/closable engaging member is inserted into said engagement hole, said plate-like member projects forwards from the distal end of said flexible pipe, and thereafter said plate-like member is relatively moved in a drawing direction with respect to said flexible pipe;  
20 and

wherein two connecting members, of said four connecting members, which are supported by said fixed shaft abut against a circumferential edge of an opening of said engagement hole while being opened in a direction wherein  
25 said fixed shaft and said driving shaft approach each other

to draw said flexible pipe into said engagement hole to thereby close the opening with said flexible pipe to obtain a connected state.

19. The capsule endoscope holder according to claim  
5 18, wherein, when said plate-like member relatively moves with respect to said flexible pipe in a projecting direction in said connected state, said two connecting members supported by said fixed shaft are closed so that said fixed shaft and said driving shaft move away from each other while  
10 the distal end of the plate-like member presses a base of said engagement hole to, thereby disconnect said flexible pipe from said engagement hole.

20. The capsule endoscope holder according to claim  
16, wherein one of said cable and said plate-like member  
15 is biased by a spring member in a direction wherein said openable/closeable engagement member is opened.

21. A capsule endoscope comprising:  
an engagement hole having closed end, formed in a sealed capsule container of the capsule endoscope; and  
20 external terminals provided in the engagement hole, said external terminals being electrically conductive with an electrical wiring in the sealed capsule container, and said external terminals being electrically conductive with terminals of an engagement member inserted into the  
25 engagement hole.



22. The capsule endoscope according to claim 21, wherein said engagement hole comprises a narrowed opening, and said engagement hole is enlarged toward the base.

23. The capsule endoscope according to claim 22,  
5 wherein said engagement member comprises an elongated flexible portion which can bend in accordance with an operation at a proximal end thereof, wherein the distal end of said elongated flexible portion is inserted into the proximal end of a member which is insertable into a  
10 patient's body so that said distal end of said elongated flexible portion inserted into a patient's body is held by engagement between said engagement member and said engagement hole.

24. The capsule endoscope according to claim 21,  
15 wherein a switching device for starting and stopping electrical conduction between said external terminals and the electric wiring in the capsule container is provided in the engagement hole;

wherein an operational portion of the switching  
20 device is provided at the base of said engagement hole; and

wherein said switching device allows electrical conduction between the external terminals and the electric wiring in the capsule container while the engagement member is inserted into the engagement hole so as to activate  
25 said operational portion.

25. A capsule endoscope holder for holding a capsule endoscope including an engagement hole with a narrow opening, formed on an end of a capsule; and external terminals provided in the engagement hole, being  
5 electrically conductive with an electrical wiring in the capsule container, said capsule endoscope holder comprising:

an engagement member provided at a distal end of a flexible long member, said engagement member being inserted  
10 into the engagement hole in a closed state, said engagement member engaging with the engagement hole when said engagement member is opened within the engagement hole, whereas said engagement member is disengaged with the engagement hole when the engagement member is closed,  
15 wherein the engagement member further includes terminals being electrically conductive with the corresponding external terminals in the engagement hole while the engagement member is inserted in the engagement hole.

20 26. The capsule endoscope holder according to claim 25, wherein the capsule endoscope holder includes said flexible long member having an elongated flexible portion which can bend in accordance with an operation at a proximal end thereof, wherein the distal end of said elongated  
25 flexible portion of said flexible long member is inserted

into the proximal end of a member which is insertable into a patient's body; wherein said engagement member being provided at the distal end of said elongated flexible portion of said flexible long member; and

5            wherein the engagement member is inserted into the engagement hole in a closed state to be opened within the engagement hole so as to engage with the engagement hole, and in order to disengage said engagement member, said engagement is closed so as to be drawn out of said  
10 engagement hole.

27. The capsule endoscope holder according to claim 25, wherein said flexible long member comprises a flexible pipe;

          wherein said engagement member includes a movement  
15 manipulation member provided at the proximal end of said flexible pipe and a cable driven by said movement manipulation member, said movement manipulation member and said cable being slidably inserted into said flexible pipe; and

20            said engagement member is attached to the distal end of said flexible pipe, wherein said engagement member is closed and opened with relative movement between said cable and said flexible pipe.

28. The capsule endoscope holder according to claim  
25 27, wherein said openable/closable engagement member

comprises:

four connecting members; and

a plate-like member driven by a cable so as to project from and be drawn back into said flexible pipe;

5 wherein said four connecting members constitute a quadric crank chain by a fixed shaft attached to the distal end of said flexible pipe and a driving shaft attached to said plate-like member, said fixed shaft and said driving shaft being relatively moveable to be away from each other and  
10 to approach each other; and

wherein said fixed shaft and said driving shaft move away from each other and approach each other in the same direction as said plate-like member moves along via movement of said plate-like member in projecting and  
15 drawing directions with respect to said flexible pipe.

29. The capsule endoscope holder according to claim 28, wherein the terminals of the engagement member are provided at predetermined intervals on a face of the plate-like member, opposite to a face where the fixed shaft  
20 is attached and the connecting members are positioned in a direction approximately orthogonal to a direction in which the plate-like member is inserted into and drawn out of the engagement hole, and

wherein the external terminals of the capsule  
25 endoscope are provided on a surface of the engagement hole

so as to correspond to the terminals of the plate-like member.

30. The capsule endoscope holder according to claim 29, wherein when said openable/closable engaging member is  
5 inserted into said engagement hole, said plate-like member projects forwards from the distal end of said flexible pipe, and thereafter said plate-like member is relatively moved in a drawing direction with respect to said flexible pipe; and

10 wherein two connecting members, of said four connecting members, which are supported by said fixed shaft abut against a circumferential edge of an opening of said engagement hole while being opened in a direction wherein said fixed shaft and said driving shaft approach each other  
15 to draw said flexible pipe into said engagement hole to thereby close the opening with said flexible pipe to obtain a connected state, whereby each of the terminals attached to the plate-like member is brought into an electrically conductive state with each of the external terminals  
20 provided in the engagement hole.

31. The capsule endoscope holder according to claim 30, wherein, when the plate-like member relatively moves with respect to said flexible pipe in a projecting direction in the connected state, the two connecting members  
25 supported by the fixed shaft are closed in a direction

wherein said fixed shaft and said driving shaft move away from each other while the distal end of the plate-like member presses the base of the engagement hole, so that the terminals attached to the plate-like member are not  
5 electrically connected with the respective external terminals provided in the engagement hole, thereby separating the flexible pipe from the engagement hole.

32. The capsule endoscope holder according to claim 30, wherein an operational portion of a normally open switch  
10 device for starting and stopping electrical conduction between each of the external terminals provided in the engagement hole and an electronic member included in the capsule is provided at the base of the engagement hole, wherein the operational portion is pressed by the  
15 plate-like member in said connected state to be closed when the plate-like member is inserted into the engagement hole.

33. The capsule endoscope holder according to claim 30, wherein the external terminals are connected to a power source provided within the capsule container so that  
20 electric power is supplied from the terminals.

34. The capsule endoscope holder according to claim 30, wherein the external terminals are connected to a driving signal switching circuit for driving an image pickup device provided within the capsule container so  
25 that an image pickup device driving signal is supplied from

the external terminals.